HP E3491B Pentium® Processor Probe

Run Control for Pentium Processor and Pentium Processor with MMX™ Technology

For use with HP logic analyzers

The HP E3491B Pentium processor probe provides the Pentium system designers with processor run control. It also gives them the ability to read and modify the contents of registers, system memory and I/O. In addition, the HP E3491B increases debug efficiency by expanding the capabilities of the HP 16500C logic analysis system and HP 16505A prototype analyzer.

Increasing System Debug Efficiency

Pentium processor based system debug is simplified by using the HP E3491B in combination with the HP 16500C/HP 16505A logic analysis tools. Combining logic analysis and processor run control provides you with the system visibility needed to trace problems to their root cause quickly.

Following program operation with a logic analyzer while cache memories are enabled is very difficult, because the processor may execute out of internal memory for hundreds of instructions. The HP E3491B enhances real-time debug using a logic analyzer by providing a simple means of enabling the Pentium processor's branch trace messaging. With branch messaging enabled the HP E2457A Pentium processor interface, in combination with HP 16550 family logic analyzer modules, will display branch messages. Using the logic analyzer in this mode reveals your program's path while the processor is executing out of cache memory.

The powerful triggering facilities of the HP 16550 family of logic analyzer modules expand the breakpoint conditions usable for stopping program execution. While the Pentium processor is limited to breaking execution on selected addresses, logic analyzer triggers can be defined that span address, status, and data. The HP 16550 family modules can be set to generate a breakpoint on a write of a particular data value to a specific memory or I/O address.

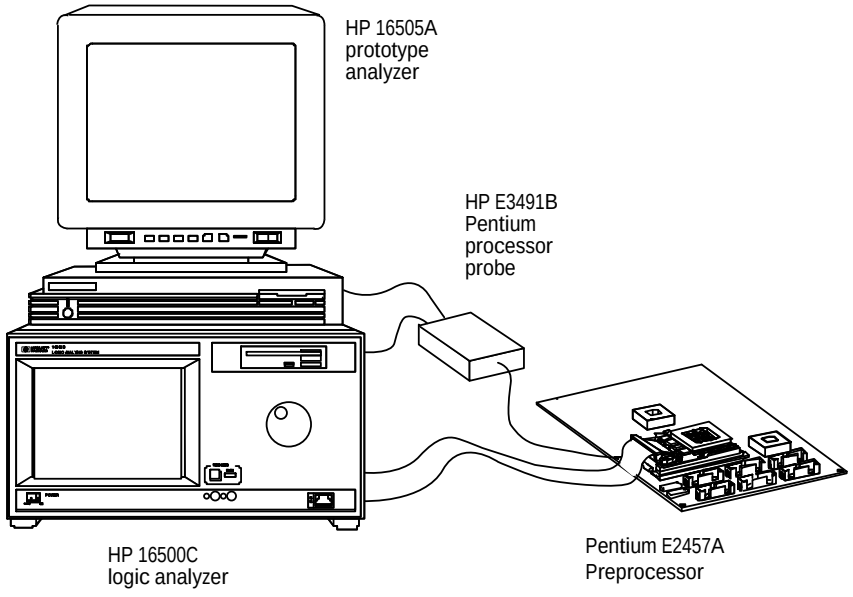

Figure1. Pentium System Debug Environment

Increasing Your Insight into Elusive Hardware Problems

- **View and Modify System State**
  The Pentium processor probe allows you to easily display and modify the contents of processor registers, MMX registers, system memory and I/O.

- **Break Processor Execution**
  Now you can stop processor execution based on conditions internal to the processor or the events on system buses. Simply use the HP E3491B to set up the Pentium processor's four breakpoint registers to stop execution on conditions internal to the processor. In addition you can use the powerful triggering capabilities of the HP 16550 family of logic analyzer modules to recognize events on system buses and stop the processor, through the Trigger Out of the HP 16500C and Break Input of the HP E3491B.

- **Display Code as Instructions**
  View memory code segments disassembled into familiar Pentium processor instructions including MMX instructions. The memory disassembly window of the HP E3491B displays your code as Pentium processor mnemonics from any starting address.

- **Control Processor Execution**
  From the run control window of the HP E3491B you can instruct the processor to run, break, reset, or single step. You select whether memory, I/O, and register displays are updated on processor breakpoint execution or on single step.

- **Use the Flexible User Interface**
  You define the view of your system that maximizes insight into its current operation. The HP E3491B set up and display interface is integrated into the workspace of the HP 16505A prototype analyzer. The flexible workspace of the HP 16505A lets you control both the HP E3491B and the 16500C logic analysis system. Open windows in the workspace to display logic analyzer trace listings or waveforms of PCI bus activity adjacent to processor registers and system memory displays.

- **Repeat Frequently Used Setups**
  Writing procedures that set up registers, memory and I/O in your system are easy with the HP E3491B command language. Once the procedure is written, save it to the HP 16505A hard disk. When you want to initialize your hardware system to a particular state, simply recall and execute the procedure.

- **Connection to Your Target System**
  Simply connect the control port of the HP E3491B to the Pentium processor debug port on your board or the HP E2457A Pentium logic analyzer probe. The HP E3491B supports both the 20-pin and 30-pin Pentium processor debug port connectors.

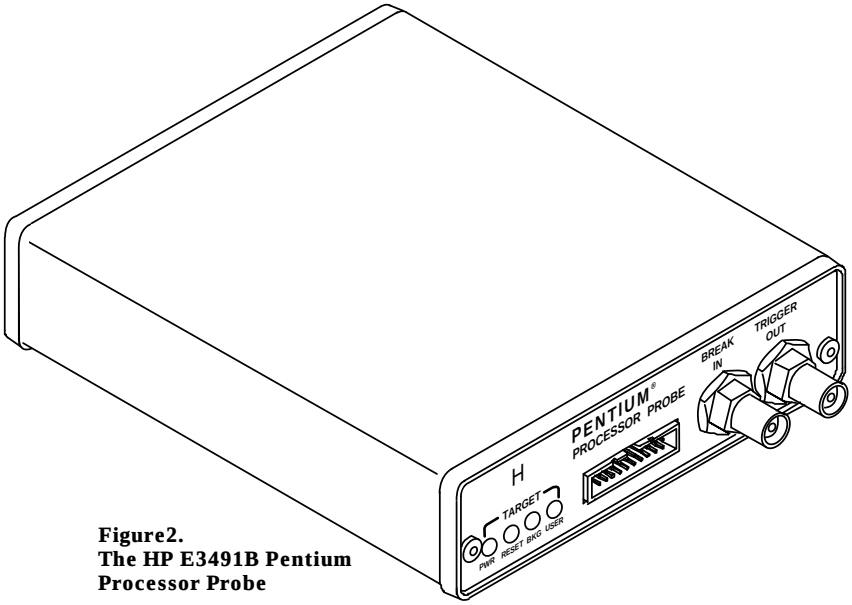

Figure2.
The HP E3491B Pentium Processor Probe

Features and Specifications

Features

- Processor run control
  Processor run control facilities for RUN, BREAK, RESET, and SINGLE STEP.

- Register read and write
  Examine and edit all registers (1) including MMX registers

- Breakpoint registers
  Examine, set and edit the Pentium processor's four hardware breakpoint registers (1)

- Memory and I/O read and write
  Examine and edit memory and I/O locations

- Memory Disassembly
  Disassembles memory code segments into Pentium processor mnemonics (1) including MMX instructions

- Command Language
  Command language provides a convenient way to develop and save frequently used hardware setup procedures.

- Coordinated run control

  Break In, input is edge sensitive. Processor execution stops on Break In active edge. Active edge of input is user selectable.

  Trigger Out, output transitions to active state when the processor stops execution. Trigger out returns to inactive state when user program begins execution. Active state of Trigger Out is user selectable.

- User Interface
  The HP E3491B is controlled from the HP 16505A prototype analyzer user interface.

Specifications

Supported Processors	Pentium processors and Pentium processors with MMX technology
Physical connections	10base2 or 10baseT Ethernet connections TCP/IP protocol Compatible with Pentium processor debug port [1] 20 pin or 30 pin connectors
Physical	155 mm width × 161 mm depth × 65 mm height
Environmental **Temperature**	 Operating 0 to +55 °C (+32 °F to 131 °F) Non operating – 40 °C to 70 °C (– 40 °F to + 158 °F)
Humidity	15% to 95% relative
Supplied with HP E3491B	Pentium processor probe 20 pin cable 30 pin cable HP E3491B user interface software (for the HP 16505A) on disc power supply module

[1] As documented in the Intel Pentium Family User's Manual; Data Book

Ordering Information

HP E3491B
Pentium processor probe for the Pentium processor and Pentium processor with MMX technology

HP E2457A (HP 16505A prototype analyzer software)
Preprocessor interface for the Pentium processor and Pentium processor with MMX technology

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HP 16554A
500K-Sample, 70-MHz state/250-MHz timing logic analyzer module
(Requires an HP 16500C mainframe)

HP 16555A/D
1M/2M-Sample, 110-MHz state/500-MHz timing logic analyzer module
(Requires an HP 16500C mainframe)

HP 16556A/D
1 M/2M-Sample, 100 MHz state/400 MHz timing logic analyzer module
(Requires an HP 16500C mainframe)

HP 16550A
100-MHz state/500-MHz timing logic analyzer module

HP 16500C
Logic Analysis System Mainframe

HP 16505A
Prototype Analysis System

HP E2479A
Upgrades an HP 16500A or HP 16500C mainframe to an HP 16500C mainframe

HP B4600A
System performance analysis for the HP 16505A prototype analyzer

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Warranty Information

This Hewlett-Packard product has a warranty against defects in material and workmanship for a period of one year from date of shipment. During this warranty period, Hewlett-Packard Company will, at its option, either repair or replace products that prove to be defective.

Related HP Literature

HP 16500C Logic Analysis System and HP 16505A Prototype Analyzer, 5965-3187E
HP E2457A Pentium® Preprocessor, *5962-9730E*

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